

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method performed by one or more server devices, the method comprising:

collecting, by one or more processors of the one or more server devices, information associated with a group of users visiting a web site that includes an advertising link, where the group of users visiting the web site includes a set of non-malicious users and a different set of malicious users, where the collecting information includes tracking activities of the group of users visiting the web site;

identifying, by one or more processors of the one or more server devices, the set of non-malicious users visiting the web site from the group of users visiting the web site based ~~at least~~ in part on the collected information;

where the tracking activities includes at least one of:

determining whether images are loaded by the users, in the group of users,
where identifying the set of non-malicious users includes identifying users, in the group of users,
that are determined as loading images, where the set of non-malicious users includes the users that
are determined as loading images,

determining whether the users, in the group of users, have javascript turned
on, where identifying the set of non-malicious users includes identifying users, in the group of users,
that are determined as having javascript turned on, where the set of non-malicious users includes the
users that are determined as having javascript turned on,

determining a type of browser used by the users, in the group of users, where

identifying the set of non-malicious users includes identifying users, in the group of users, that are determined as using a browser, where the set of non-malicious users includes the users that are determined as using a browser,

determining a number of times during an interval that users, in the group of users, visit the web site, where identifying the set of malicious users includes identifying a first set of users, in the group of users, that are determined to have visited the web site a number of times, during the interval, that exceeds a threshold number of times, where the set of non-malicious users includes a second set of users, in the group of users, that is different from the identified first set of users,

determining, when the web site is associated with a search engine, a type of items for which searches are performed by the users in the group of users, where identifying the set of malicious users includes identifying a first set of users, in the group of users, that are determined to have performed searches in an ordered manner, where the set of non-malicious users includes a second set of users, in the group of users, that is different from the first set of users, or

identifying non-malicious users based on an age of cookie identifiers associated with the users in the group of users;

identifying, by one or more processors of the one or more server devices, a first proportion of a quantity of non-malicious users visiting the web site to a total quantity of users visiting the web site;

~~detecting~~ ~~determining~~, by one or more processors of the one or more server devices, an occurrence of spamming of the advertising link on the web site, where the ~~detecting~~ ~~determining~~ includes:

identifying a second proportion of a quantity of clicks on the advertising link

by identified non-malicious users to a total quantity of clicks on the advertising link by the group of users, [[and]]

comparing the identified first proportion to the identified second proportion,
and

determining that the spamming has occurred when the identified first proportion is greater than the identified second proportion; and

taking a remedial measure when the occurrence of spamming on the web site ~~website~~ is ~~determined~~ detected.

2-7. (Canceled herein)

8. (Currently amended) The method of claim [[2]] 1, where the tracking activities further includes:

tracking activities of users₁ in the group of users₁ visiting another web site.

9. (Canceled herein)

10. (Canceled herein)

11. (Currently amended) The method of claim 1, ~~where each of the users in the group of users is associated with a network address, and where the identifying non-malicious users includes~~ further including:

identifying the non-malicious users based ~~at least in part~~ on [[the]] network

addresses associated with the users in the group of users.

12-14. (Previously canceled)

15. (Currently amended) The method of claim 1, where the ~~determining~~ detecting the occurrence of spamming on the web site includes:

detecting ~~determining~~ an occurrence of spamming of at least one advertisement on the web site, and

where taking the remedial measure comprises:

providing a refund in response to detecting ~~determining~~ that the at least one advertisement has been spammed.

16-18. (Canceled herein)

19. (Currently amended) A method performed by one or more server devices, the method comprising:

identifying, by one or more processors of the one or more server devices, a group of non-malicious users visiting a web site, where the identifying includes:

tracking an activity of users visiting the web site, where the tracking includes determining, for each user, at least one of whether the user loads images, an age of a cookie associated with the user, whether the user has javascript turned on, a type of browser used by the user, or an interval at which the user visits the web site, and

identifying the group of non-malicious users based on the tracked activity,

where the group of non-malicious users includes users that load images, have a cookie that is older than a predetermined age, have javascript turned on, are using a predetermined type of browser, or have visited the web site at an interval that exceeds a threshold interval;

determining, by one or more processors of the one or more server devices, ~~[[a]]~~ an estimated click rate of an advertisement item associated with the web site for the group of non-malicious users, where the determining the estimated click rate includes:

estimating a percentage of non-malicious visitors visiting the web site, and
setting the estimated click rate to approximately equal to the estimated
percentage; [[and]]

determining, by one or more processors of the one or more server devices, whether the advertisement item has been click spammed based ~~at least in part~~ on the determined estimated click rate for the group of non-malicious users, where the determining whether the advertisement has been click spammed includes:

comparing the determined estimated click rate of the advertisement to an
actual overall click rate of the advertisement, and

determining that the advertisement has been click spammed when the actual
overall click rate exceeds the determined estimated click rate; and

taking remedial measures in response to determining that the advertisement has been
click spammed.

20-24. (Canceled herein)

25. (Currently amended) The method of claim ~~[[24]]~~ 19, where the determining whether

the advertisement item has been click spammed further includes:

determining whether the ~~[[an]]~~ actual overall click rate of the advertisement item for the group of non-malicious users differs from the determined estimated click rate by at least a predetermined ~~[[set]]~~ percentage ~~of clicks of the item~~.

26. (Currently amended) The method of claim 19, where the determining the estimated ~~[[a]]~~ click rate of the advertisement item includes:

determining different estimated click rates of the advertisement item for the group of non-malicious users, the different estimated click rates corresponding to different time periods.

27. (Currently amended) The method of claim 26, where the different time periods include different times of a day or week.

28. (Currently amended) The method of claim 26, where the different time periods include different months of a year.

29. (Currently amended) A non-transitory computer-readable memory device containing instructions for controlling at least one processor to perform a method for detecting a spamming of an advertisement presented ~~displayed~~ by a server, the method comprising:

identifying non-malicious visitors to the server, where identifying the non-malicious visitors includes ~~identifying that the non-malicious visitors are not spam programs~~;

tracking an activity of users visiting the server, where the tracking includes determining, for each user, at least one of whether the user loads images, an age of a cookie

associated with the user, whether the user has javascript turned on, a type of browser used by the user, or an interval at which the user visits the server, and

identifying the non-malicious visitors based on the tracked activity, where the non-malicious visitors include visitors that load images, have a cookie that is older than a predetermined age, have javascript turned on, are using a predetermined type of browser, or have visited the web site at an interval that exceeds a threshold interval;

determining an estimated [[a]] click rate of the advertisement for the non-malicious visitors, where the determining the estimated click rate includes:

estimating a percentage of non-malicious visitors visiting the server, and
setting the estimated click rate to approximately equal to the estimated
percentage; [[and]]

determining whether the advertisement has been spammed based ~~at least in part~~ on the determined estimated click rate for the non-malicious visitors, where the determining whether the advertisement has been spammed includes:

comparing the determined estimated click rate of the advertisement to an actual click rate of the advertisement, and

determining that the advertisement has been spammed when the actual overall click rate exceeds the determined estimated click rate; and

taking remedial measures in response to determining that the advertisement has been spammed.

30. (Canceled herein)

31. (Currently amended) A method performed by one or more processors of one or more server devices, the method comprising:

tracking, by one or more processors of the one or more server devices, activities of users visiting a web site that includes one or more advertising links, the tracking including determining, for each ~~user~~ of a plurality of the users, at least one of:

whether ~~[[the]]~~ said each user loads images,
an age of a cookie associated with said each user,
whether ~~[[the]]~~ said each user has javascript turned on,
a type of browser used by ~~[[the]]~~ said each user, or
an interval at which ~~[[the]]~~ said each user visits the web site;

identifying, by one or more processors of the one or more server devices, non-malicious users from among the users visiting the web site based ~~at least in part~~ on the tracked activities;

determining, by one or more processors of the one or more server devices, whether the advertising link has been spammed, where the determining includes:

determining an estimated click rate of the advertisement for the non-malicious users, where the determining the estimated click rate includes:

estimating a percentage of non-malicious users visiting the web site,
and

setting the estimated click rate to approximately equal to the estimated percentage,

comparing an actual click rate of the advertising link by non-malicious users to the ~~[[an]]~~ estimated click rate of the advertising link by non-malicious users, ~~where the estimated~~

~~click rate is based at least in part on historical data that includes data indicating a click rate of the advertising link by non-malicious users during a previous time period~~

determining, based on the comparing, whether the actual click rate is greater than the estimated click rate; and

taking a remedial measure when the occurrence of spamming on the web site is determined.

32. (Canceled herein)

33. (Previously canceled)

34-41. (Canceled herein)

42. (Currently amended) The method of claim 31, further comprising:
determining a quantity of the ~~identified~~ non-malicious users that click ~~clicks~~ the advertisement link; and

determining whether the advertisement has been spammed based ~~at least in part~~ on the determined quantity of the ~~identified~~ non-malicious users that clicks the advertisement.

43. (Canceled herein)

44. (Canceled herein)

45. (Currently amended) The method of claim 1, where the determining that the ~~occurrence of spamming~~ has occurred on the web site further includes:

determining, based ~~at least in part~~ on the comparing, that the identified first proportion is greater than the identified second proportion plus a predefined threshold.

46. (Canceled herein)

47. (New) A non-transitory computer-readable memory device storing instructions for controlling at least one processor to perform a method comprising:

tracking activities of users visiting a web site that includes one or more advertising links, the tracking including determining, for each of a plurality of the users, at least one of:

whether said each user loads images,

an age of a cookie associated with said each user,

whether said each user has javascript turned on,

a type of browser used by said each user, or

an interval at which said each user visits the web site;

identifying non-malicious users from among the users visiting the web site based on the tracked activities;

determining whether a particular advertising link, of the one or more advertising links, has been spammed, where the determining includes:

determining an estimated click rate of the particular advertising link for the non-malicious users, where the determining the estimated click rate includes:

estimating a percentage of non-malicious users visiting the web site,

and

setting the estimated click rate to approximately equal to the estimated percentage,

comparing an actual click rate of the particular advertising link by non-malicious users to the estimated click rate of the advertising link by non-malicious users,

determining, based on the comparing, that spamming has occurred when the actual click rate is greater than the estimated click rate; and

taking a remedial measure when the occurrence of spamming on the web site is determined.

48. (New) The non-transitory computer-readable memory device of claim 47, where the determining whether the advertising link has been spammed further includes:

determining whether the actual click rate of the advertising link, by non-malicious users, is greater than an expected click rate of the advertising link by non-malicious users, where the expected click rate is based on historical data associated with the advertising link.

49. (New) The non-transitory computer-readable memory device of claim 47, where the method further includes:

identifying the non-malicious users based on network addresses associated with the users.

50. (New) The non-transitory computer-readable memory device of claim 47, where taking the remedial measure comprises:

providing a refund in response to detecting the occurrence of spamming on the web site.

51. (New) The non-transitory computer-readable memory device of claim 29, where the determining whether the advertisement has been spammed further includes:

determining whether the actual click rate of the advertisement for the non-malicious users differs from the determined estimated click rate by at least a predetermined percentage.

52. (New) The non-transitory computer-readable memory device of claim 29, where the determining the estimated click rate of the advertisement includes:

determining different estimated click rates of the advertisement for the non-malicious users, the different click rates corresponding to different time periods.

53. (New) The non-transitory computer-readable memory device of claim 52, where the different time periods include different times of a day or week.

54. (New) The non-transitory computer-readable memory device of claim 52, where the different time periods include different months of a year.

55. (New) A method performed by one or more processors of one or more server devices, the method comprising:

tracking, by one or more processors of the one or more server devices, activities of users visiting a web site that includes an advertising link, the tracking including determining, for

each of a plurality of the users, at least one of:

whether said each user loads images,
an age of a cookie associated with said each user,
whether said each user has javascript turned on,
a type of browser used by said each user, or
an interval at which said each user visits the web site;

identifying, by one or more processors of the one or more server devices, non-malicious users from among the users visiting the web site based on the tracked activities;

determining, by one or more processors of the one or more server devices, whether the advertising link has been spammed, where the determining includes:

comparing an actual click rate of the advertising link to an expected click rate of the advertising link by non-malicious users, where the expected click rate is based on historical data associated with the advertising link, and

determining, based on the comparing, that the advertising link has been spammed when the actual click rate is greater than the expected click rate; and

taking a remedial measure upon determining that the advertising link has been spammed.

56. (New) The method of claim 55, further comprising:

determining the actual click rate of the advertising link.

57. (New) The method of claim 55, where the actual click rate is an overall click rate associated with the advertising link.